

ADDITIONAL NOTES ON THE GENUS LIPPIA. XII

Harold N. Moldenke

LIPPIA SAVORYI Meikle

Additional bibliography: Moldenke, *Phytologia* 39: 456. 1978.

Material of L. savoryi has been misidentified and distributed in some herbaria as Lantana sp.

Additional citations: SOUTH AFRICA: Transvaal: Kinges 167 (Mu), 1868 (Mu), 1869 (Mu); Leistner 3199 (Mu); Merxmüller & Giese 666 (Mu); Noel 2403 (Mu).

LIPPIA SCABERRIMA Sond.

Additional synonymy: Lippia scaberrima Souder ex Grieve, *Modern Herb.* 486, sphalm. 1967.

Additional & emended bibliography: H. H. W. Pearson in *Thiselt.-Dyer*, *Fl. Cap.* 5: 193—195. 1901; Power & Tutin, *Arch. Pharm.* 245: 337—350. 1907; Power & Tutin, *Chem. Abstr.* 2: 1860—1861. 1908; Grieve & Leyel, *Mod. Herb.* imp. 1, 2: 831. 1931; G. Klein, *Handb. Pflanzenanal.* 2 (1): 498, 502, 504, 514, & 762 (1932) and 3 (2): 1232. 1932; Watt & Breyer-Brandwijk, *Med. & Poison. Pl. S. Afr.*, ed. 1, 154 & 235. 1932; Karrer, *Konstit. & Vork. Organ. Pflanzenst.* 17. 1958; Grieve & Leyel, *Mod. Herb.*, imp. 2, 2: 831. 1959; Watt & Breyer-Brandwijk, *Med. & Poison. Pl. S. & East. Afr.*, ed. 2, 1053 & 1410. 1962; Moldenke, *Phytologia* 13: 367. 1966; C. A. Sm., *Common Names S. Afr. Pl.* 99, 320, & 601. 1966; Grieve, *Modern Herb.* 486 & 831. 1967; Uphof, *Dict. Econ. Pl.*, ed. 2, 315. 1968; Farnsworth, Blomster, Quimby, & Schermerh., *Lynn Index* 6: 265 & 266. 1969; Moldenke, *Fifth Summ.* 1: 254, 257, & 421 (1971) and 2: 543, 567, & 894. 1971; Altschul, *Drugs & Foods* 244. 1973; Moldenke, *Phytologia* 25: 240 (1973) and 39: 439 & 447. 1978.

Recent collectors describe this plant as a small low-growing shrublet and have found it growing on sandy open tree veld with Combretum, Terminalia, and Acacia, and "localized, especially on disturbed sites", at altitudes of 4750—5000 feet, flowering in February. The corollas are said to have been "white" on Rodin 3518. Vernacular names reported for the species are "benkelbossie", "benkess boas", "beukesbossie", "beukessboss", "laventelbossie", "bewkesbos", and, in Zulu, "umsuzwane".

Karrer (1958) reports the finding of n-heptacosan, C₂₇H₅₆, in this plant, as well as in such unrelated plants as Nothopanax simplex, Salvia sclarea, Erythraea centaurium, Trifolium pratense, Tussilago farfara, Papaver rhoeas, Boronia megastigma, Caesalpinia bonducella, Populus balsamifera, Mandragora autumnalis, and Pinus spp. Smith (1966) reports that an infusion of L. scaberrima with brandy is used as a stomachic and that leaf infusions are used as a tonic and to treat hemorrhoids among the Bantu in Africa. Grieve

(1931) states that it contains lippianol, smelling like lavender. Watt & Breyer-Brandwijk (1962) report the Zulu using the tonic orally or as an enema and also giving it to domestic animals. The Dutch in South Africa not only use the leaf-decoction in brandy as a stomachic and tonic but also as a counter-irritant for back-ache. The lemon-scented leaves are said to have hemostatic and aperient properties and are used in the treatment of hemorrhoids. By the presence of tannin, a glucoside, verbenalin, and a resin, the plant is also an astringent carminative. Farnsworth (1969) lists the following substances as found in the stems and leaves of L. scaberrima: tannin, a volatile oil, formic and butyric acids, heptacosane, hentriacotane, paraffin, a phytosterol, unsaturated alcohols, esters of formic, butyric, valerianic, arachnic, and linoleic acids, lippianol, two yellow crystalline substances, glucose, and a glucoside, but no alkaloids.

It should be noted that the Lippia scaberrima of Altschul (1973) is actually Phyla scaberrima (A. L. Juss.) Moldenke.

Material of Lippia scaberrima Sond. has been misidentified and distributed in some herbaria as L. rehmanni H. H. W. Pearson.

Additional citations: NAMIBIA: Rodin 3518 (Ba). SOUTH AFRICA: Transvaal: Scheepers 1493 (Mu).

LIPPIA SCAPOSA Briq.

Additional bibliography: Moldenke, Biol. Abstr. 47: 6794. 1966; Moldenke, Phytologia 14: 417. 1967; Hocking, Excerpt. Bot. A.11: 103 & 104. 1967; Moldenke, Fifth Summ. 1: 186 (1971) and 2: 565 & 894. 1971; Troncoso, Darwiniana 18: 340 & 410. 1974.

The corollas are said to have been "yellow" on Jørgensen 4583.

Additional citations: PARAGUAY: Jørgensen 4583 (E-1006229).

LIPPIA SCAPOSA var. MELANOCAULOS Briq.

Additional bibliography: Moldenke, Phytologia 12: 480. 1965; Moldenke, Fifth Summ. 1: 186 (1971) and 2: 894. 1971.

LIPPIA SCHAUERIANA Mart.

Synonymy: Lippia schaueriana Mart. & Schau. ex Troncoso, Darwiniana 18: 339. 1974.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 266. 1858; Solered., Syst. Anat. Dicot. 713. 1899; D. H. Scott in Solered., Syst. Anat. Dicot. [transl. Boodle & Fritsch] 1: 631. 1908; Moldenke, Phytologia 12: 480-481. 1965; Moldenke, Fifth Summ. 1: 157 (1971) and 2: 894. 1971; Moldenke, Phytologia 28: 460. 1974; Troncoso, Darwiniana 18: 339 & 410. 1974.

Additional citations: BRAZIL: Pernambuco: Martius 243 (Mu--129--type, Z--isotype).

LIPPIA SCHLECHTENDALII Moldenke

This taxon is now relegated to the synonymy of L. hirsuta var. moritzii (Turcz.) López-Palacios.

LIPPIA SCHLIEBENI Moldenke

Additional synonymy: Lippia schliebenii Moldenke, *Phytologia* 25: 240, in syn. 1973.

Additional bibliography: Moldenke, *Phytologia* 14: 417. 1967; Moldenke, *Fifth Summ.* 1: 231, 237, & 241 (1971) and 2: 543, 774, & 894. 1971; Moldenke, *Phytologia* 25: 240 (1973) and 39: 105 & 437. 1978.

Recent collectors have found this plant growing on tree steppes at 1100—1500 m. altitude and refer to it as 2 m. tall and very abundant, flowering in January. They record the vernacular name, "zafagafaga". The corollas on Endlich 57 are said to have been "whitish".

Material of this species has been misidentified and distributed in some herbaria as L. asperifolia Rich. and as Lantana viburnoides Vahl.

Additional citations: TANZANIA: Tanganyika: Endlich 57 (Mu), 57a (Mu—4238), 57b (Mu—4239); Holst 8893 (Mu—1758); Schlieben 4548 (Mu).

LIPPIA SCHLIMII Turcz.

Additional synonymy: Lippia schlimii (Moldenke) Moldenke, *Phytologia* 26: 374, in syn. 1973.

Additional bibliography: Hocking, *Excerpt. Bot. A.9*: 289—290. 1965; Moldenke, *Phytologia* 12: 484—486. 1966; Moldenke, *Résumé Suppl.* 16: 4. 1968; Moldenke, *Fifth Summ.* 1: 117, 118, 124, & 366 (1971) and 2: 556, 565, 568, & 894. 1971; López-Palacios, *Fac. Farm. Univ. Los Andes* 15: 58 & 62. 1975; Moldenke, *Phytologia* 31: 381. 1975; López-Palacios, *Revist. Fac. Farm. Univ. Los Andes* 17: 48. 1976; Moldenke, *Phytologia* 38: 475 (1978) and 39: 92 & 93. 1978.

Recent collectors refer to this plant as an unarmed tree, 4—12 m. tall, the trunk cylindric, erect, to 12 cm. in diameter, "madera para lena", the leaves deep-green and rugose above, paler green beneath, and have found it growing in "selva siempreverde a lo largo de la quebrada sobre rocas calcáreas", at 1700—2700 m. altitude, flowering in January, February, and July, fruiting in January. The corollas are said to have been "white" on Ruiz-Terán & López-Palacios 2350 & 10414 and "dull-white" on Steyermark 104919. The vernacular name, "saca candela", is reported for it.

López-Palacios (1975) says: "Es ésta una especie media entre la hirsuta y la moritzii, si es que esta última llega a sostenerse. Sus hojas son algo variables (oblongas a ovadas) de envés poco indumentado y sus inflorescencias de cabezuelas por lo general abundantes y pequeñas. Atribuyo a esta taxon las colecciones Steyermark 104919 y Ruiz-Terán & López-Palacios 10414".

Material of L. schlimii has been misidentified and distributed in some herbaria as L. moritzii Turcz.

Additional citations: VENEZUELA: Lara: J. A. Steyermark 104919 (N). Trujillo: Ruiz-Terán & López-Palacios 2350 (N), 10414 (Z).

LIPPIA SCHLIMII var. GLABRESCENS (Moldenke) Moldenke

Additional synonymy: Lippia floribunda H.B.K., Nov. Gen. & Sp., ed. folio, 2: 216. 1817 [not L. floribunda Briq., 1900, nor Hort., 1959, nor R. A. Phil., 1891]. Lippia floribunda Kunth ex Spreng. in L., Syst. Veg., ed. 16, 2: 753. 1825. Lippia floribunda Humb. & Bonpl. ex Steud., Nom. Bot., ed. 2, 2: 54. 1811. Lippia floribunda Humb. & Kunth ex D. Dietr., Syn. Pl. 3: 599. 1843. Lippia schlimii var. glabrescens Moldenke, Phytologia 26: 374, in syn. 1973.

Additional bibliography: H.B.K., Nov. Gen. & Sp. Pl., ed. folio, 2: 216 (1817) and ed. quarto, 2: 267—268. 1818; Schau. in A. DC., Prodr. 11: 579. 1847; Buek, Gen. Spec. Syn. Candoll. 3: 266. 1858; Hocking, Excerpt. Bot. A.9: 289—290 & 367. 1965; Schubert, Assoc. Trop. Biol. Bull. 4: 73. 1965; J. A. Clark, Card-Ind. Gen. Sp. & Var. Pl., issue 245. 1965; Moldenke, Phytologia 13: 367. 1966; Moldenke, Résumé Suppl. 16: 4. 1968; Moldenke, Fifth Summ. 1: 118, 124, & 366 (1971) and 2: 556, 568, & 894. 1971; López-Palacios, Revist. Fac. Farm. Univ. Los Andes 15: 58, 59, & 61. 1975; Moldenke, Phytologia 31: 381. 1975; López-Palacios, Revist. Fac. Farm. Univ. Los Andes 17: 48. 1976; Moldenke, Phytologia 38: 475 (1978) and 39: 92, 93, & 256. 1978.

Recent collectors describe this plant as a treelet or tree, 2—16 m. tall, with a crown spread of 2—5 or more meters, the trunk 1—3 dm. in diameter at breast height, the bark gray-brown, the "young stems" medium-green shading to olive or light-tan to olive-tan on the oldest parts, or "dark-olive flushed with dark-purple", the herbage with a pungent odor, the petioles flushed dark-purple, the leaves stiff, brittle-chartaceous, dark-green, lustrous dark-green, or dark yellowish-green above and rugose or rugulose, dull-green or lustrous light-green to medium-green beneath with purple veins, the inflorescence light-green or light olive-green, the bracts light-green or olive to "more bluish", the flowers with a slight sweet fragrance, the calyx green or light-green, and the stamens light-green. They have found it growing in fields and forests, the edge of woods, and along streams by waterfalls, at 1400—3000 m. altitude, flowering in March, May, July, August, and from October to December, fruiting in March, July, August, October, and December.

The corollas are said to have been "white" or "totally white" on Barkley & Bouthillette 38C073, Cuatrecasas & Willard 26230, Duque Jaramillo 2650, Killip & al. 39841, López-Palacios 8246, Steyermark 105082, and Tillett & Höning 738-393 & 738-535, "cream with yellow center" on Tillett 737-300, "white with yellow throat" on Ruiz-Terán & López-Figueiras 2247, and "primeramente blanquicinas con el ápice de los lóbulos lilacinos y a la larga totalmente blancas" on Ruiz-Terán & López-Figueiras 1273.

Tillett found the plant to be "frequent in drier rocky soil with much leaf litter and humus on steep hillsides of quebradas", while Tillett & Höning refer to it as "common to abundant" or as "fre-

quent in remains of wet montane forest with stumps of treeferns to 1 m. in diameter, the soil with humus". Kernan describes it as "dominant". The vernacular name, "saca-ojo", has been recorded for it.

I am indebted to my friend and colleague, Santiago López-Palacios, for pointing out the synonymy of L. floribunda with the present variety after examination of the type in the Paris herbarium annotated by Bonpland. López-Palacios and his associates describe the variety as an "árbol erecto, inerme, de 4-6 m. (los hay en los alrededores de 10-12 m.), perennifolio; tronco redondo de corteza fisurada; ramitas jóvenes tetrágonas atropurpúreas puberulentas con olor a cera de abejas fresca, con pelitos pátu-los, blancos; ramitas adultos 4-gonas, pardas; hojas simples, opuestas, decusadas, coriáceas, lanceoladas, algo doblados y falcadas, verde obscuras, lucientes por la haz, verde claras, sub-lucientes por el envés, crenuladas; pecíolos subatropurpúreos; cimas paniculadas, panículas terminales, las flores en glomérulos inodoras; corolas pequeñas, blancas [or "flores blanco cremosas"]". He comments that "Esta variedad es muy característica y puede ser fácilmente identificable por el nevéz glabrescente de sus limbos. En cuanto a forma y tamaño de cabezuelas tiene las mismas variaciones de las especies afines hirsuta y moritzii, pero en la forma de las hojas se acerca más a la hirsuta. En muchos herbarios figura aún con la vieja determinación de Moldenke: L. hirsuta var. glabrescens."

Material of this taxon has been misidentified and distributed in some herbaria as L. hirsuta L. f. and even as Lepochinia sp.

Additional citations: COLOMBIA: Antioquia: Cuatrecasas & Willard 26230 (W-2402397); W. H. Hodge 6528 (Fn, Ms-34161), 6744 (Ms-34162); Killip, Barkley, & Daniel 39841 (W-1954134); López-Palacios 3890 (Ld). Boyacá: Barkley & Bouthillette 38C073 (Ld). Huila: Schultes & Villareal 5175 (Ld, Ws). Magdalena: Cuatrecasas & Castañeda 24688 (W-2325412, Z), 24717 (Fg, W-2325497). Norte de Santander: Garganta 702 (W-2771832); López-Palacios 3598 (Ld, N). Quindiu: López-Palacios & Idrobo 3700 (Ac, N). Tolima: Duque Jaramillo 2650 (N). VENEZUELA: Mérida: Gehriger 337 [296] (E-1005442); López-Palacios 2581 (Ft, N); Ruiz-Terán & López-Palacios 8246 (Ld); Ruiz-Terán, López-Palacios, & Rodríguez 6730 (N); Tillett & Höning 738-393 (N, W-2747327). Táchira: Bunting 2478 (Ld); Ruiz-Terán & López-Figueiras 1273 (N); J. A. Steyermark 105082 (N); Steyermark & Rabe 96983 (Z); Tillett 737-300 (N); Tillett & Höning 738-535 (N). Trujillo: Ruiz-Terán & López-Figueiras 2247 (N).

LIPPIA SCHOMBURGKIANA Schau.

Additional synonymy: Lippia schomburkiana Schau. apud López-Palacios, Revist. Fac. Farm. Univ. Los Andes 15: 63, sphalm. 1975.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 266, 1858; Moldenke, Phytologia 14: 417 (1967) and 15: 466. 1968; Mol-

denke, Fifth Summ. 1: 124, 130, & 157 (1971) and 2: 559, 565, & 894. 1971; Moldenke, Phytologia 25: 229 (1973) and 28: 436. 1974; López-Palacios, Revist. Fac. Farm. Univ. Los Andes 15: 61--63. 1975; Moldenke, Phytologia 31: 382 (1975) and 39: 263 & 264. 1978.

Recent collectors describe this plant as a shrub or subshrub, 1--1.5 m. tall, erect, the leaves with a lavender-like odor when crushed, and the fruit gray-green, maturing brown. They have found it growing on savannas at 33--1350 m. altitude, flowering from October to January as well as in April and July, fruiting in January, April, July, and October. The corollas are said to have been "white" on Barroso, Lima, & Lima 568 and on Santos 2529 and "cream-color" on Irwin & al. 30423. Goodland encountered it "in dry lateritic-ridged savanna grassland with scattered trees, Curtella, Byrsonima, Trachypogon, and Fimbristylis being dominant", while Irwin and his associates found it on "upper shrub-covered slopes with iron-rich rocks and gravel, the soil restricted to crevices and pockets". Pinheiro found it "in mata litoranea" and Davis refers to the plant as a "pleasant-smelling forb".

Although previously cited by me as occurring in Bolívar, Venezuela, López-Palacios is convinced that this species does not occur in Venezuela. He says (1975): "No conozco el material típico (Schomburgk 404), y parece que lo único que queda de él son las fotografías que Macbride tomó para el herbario de Chicago. En verdad la encuentro muy similar a ciertas formas xerofíticas de L. organoides, y sin decidir si son coespecíficas o no, las diferencias que se han establecido (Phytologia 12: 487) sobre forma de las hojas y de las cabezuelas no son definitivas: en L. organoides se dan también cabezuelas 4-anguladas (Cf. Schau., Prod. 11: 575). Basado en descripciones llamo la atención sobre el carácter del aroma de las hojas, de que ya se habló, pero sin poder asegurar si es ésta una característica firme."

Material of L. schomburgkiana has been misidentified and distributed in some herbaria as L. organoides H.B.K. On the other hand, the Davidse, Ramia, & Montes 4747, Irwin 402, Ruiz-Terán & López-Figueiras 1817, and Ruiz-Terán & López-Palacios 11415, distributed (and in the case of the Irwin collection previously cited by me) as L. schomburgkiana, actually are L. organoides H.B.K., while D. H. Davis 896 is Phyla betulaefolia (H.B.K.) Greene, and D. H. Davis 791 is Waltheria sp.

Additional citations: GUYANA: Carrick 1027 (K1-7027); D. H. Davis 889 (N); Goodland 215 (Ld, W-2546178), 540 (Ac, W-2546154); Goodland & Persaud 215 (N), 697 (N). BRAZIL: Bahia: Pinheiro 2140 (N); Santos 2529 (N). Goiás: Barroso, Lima, & Lima 568 (Ld). Minas Gerais: Irwin, Harley, & Onishi 30423 (Ld, N, W-2709293).

LIPPIA SCLEROPHYLLA Briq.

Additional bibliography: Moldenke, Phytologia 13: 367. 1966; Moldenke, Fifth Summ. 1: 186 & 199 (1971) and 2: 565, 568, & 894. 1971; Troncoso, Darwiniana 18: 337 & 410. 1974.

Recent collectors describe this plant as an annual herb, 60—70 cm. tall, or as a subshrub, 0.5—1 m. tall, with fragrant flowers, and have found it growing on campos and in matorrales, "generally high places", at altitudes of 220—295 m., flowering from December to February and in April, fruiting in February, April, and December. Montes refers to it as "rather abundant", while Bertoni says "not very abundant". The corollas are said to have been "white" on Montes 732, 14656, & 27694, Krapovickas & al. 14977 & 28772, Schulz 7128, and Schwarz 691, 950, 5704, & 5834 and "white, yellow in center" on Krapovickas & al. 18290. The vernacular name, "cabará-mi", is recorded for it and the plant is said to be used in popular medicine. Troncoso (1974) gives its distribution as Paraguay and the provinces of Chaco and Formosa in Argentina.

Material has been misidentified and distributed in some herbaria as Borreria sp.

Additional citations: PARAGUAY: Fiebrig 886 (Mu—4038). ARGENTINA: Misiones: Bertoni 3579 (N); Krapovickas & Cristóbal 28772 (Ld); Krapovickas, Cristóbal, Arbo, Benitez, Maruffak, Maruffak, Pire, & Tressens 18290 (Ws); Krapovickas, Cristóbal, Maruffak, Maruffak, Pire, & Tressens 14977 (Ld, Ws); T. Meyer 6658 (Ut—3305678); Montes 475 (Ld, N), 732 (N), 14656 (Ac, Ld, N, N), 27694 (N, N, N, N); A. G. Schulz 7128 (N); G. J. Schwarz 535 (Ut—3305508), 691 (N), 950 (N), 1006 (N), 1036 (N), 5323 (N), 5704 (N), 5834 (N).

LIPPIA SCLEROPHYLLA var. LORETENSIS Moldenke

Additional bibliography: Moldenke, *Phytologia* 12: 492. 1966.

LIPPIA SERICEA Cham.

Additional synonymy: Lippia sericea Schau. ex Moldenke, *Phytologia* 36: 44, in syn. 1977. Lippia stöchas Mart. ex Moldenke, *Phytologia* 36: 44, in syn. 1977.

Additional bibliography: Buek, *Gen. Spec. Syn. Candoll.* 3: 266. 1858; Moldenke, *Phytologia* 13: 367. 1966; Angely, *Fl. Anal. Fito-geogr. Est. S. Paulo*, ed. 1, 4: 836 & xi. 1971; Moldenke, *Fifth Summ.* 1: 157 (1971) and 2: 544, 550, 557, 566, & 894. 1971.

Recent collectors describe this plant as an herb, subshrub, or shrub, 45 cm. to 2 m. tall, "lax-stemmed" or erect, brittle and easily defoliating, and have found it growing in cerrado, campo cerrado, cerrado woodland "on deep red latosol", gallery forests, and gallery margins, at altitudes of 800—1150 m., flowering from March to July, fruiting in July. Anderson encountered it in cerrado in areas of cerrado sloping down to gallery forest and brejo (sedge meadow) at edge of forest. Irwin and his associates found it "among rocks in area of campo and rocky slopes", "in cerrado in area of steep slopes with campo and cerrado", and "frequent in cerrado and gallery on rocky slopes".

The corollas are said to have been "yellow" on Hatschbach 36707, Hunt & Ramos 6292, and Taxonomy Class 93, "light-yellow"

on Irwin & al. 15822 & 26917, and "cream" on Irwin & al. 15159, 18072, & 24378.

The Angely (1971) work cited above bears the incorrect title-page date of "1970". Lippia stochas Martius is based on Martius s.n. [in campis ad V. R. et alibi, Apr. Maio] in the Munich herbarium.

Additional citations: BRAZIL: Distrito Federal: Hunt & Ramos 6292 (N), 6646 (N); Irwin, Grear, Souza, & Reis dos Santos 15822 (N), 18072 (Ac, N); Taxonomy Class Univ. Bras. 93 (W--2757757). Goiás: W. R. Anderson 9502 (Ld, N); Hatschbach 36707 (Ld); Irwin, Reis dos Santos, Souza, & Fonsêca 24378 (Ac, N); Irwin, Souza, Grear, & Reis dos Santos 15159 (Ld, N). Minas Gerais: Irwin, Fonsêca, Souza, Reis dos Santos, & Ramos 26917 (Ld, Ld); Irwin, Reis dos Santos, Souza, & Fonsêca 24989 (N); Martius 1046 (Mu--132), s.n. [in campis ad V. R. et alibi, Apr. Maio] (Mu), s.n. (Mu--131); Smith, Segadas-Vianna, Egler, Ormond, Lopez da Silva, & Machline 6987 (N). State undetermined: Pohl s.n. [In Brazilia] (Mu--1117).

LIPPIA SESSILIFLORA J. G. Baker

Additional bibliography: Moldenke, Phytologia 12: 495. 1966; Moldenke, Fifth Summ. 1: 375 (1971) and 2: 894. 1971.

LIPPIA SIDOIDES Cham.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 266. 1858; Moldenke, Phytologia 14: 417. 1967; Moldenke, Résumé Suppl. 16: 6. 1968; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 4: 836 & xi, map 1387. 1971; Moldenke, Fifth Summ. 1: 157 (1971) and 2: 560, 566, & 894. 1971; Moldenke, Phytologia 23: 418 (1972) and 28: 439. 1974; Troncoso, Darwiniana 18: 337 & 410. 1974; Moldenke, Phytologia 39: 39 & 173. 1978.

Recent collectors describe this plant as a shrub, 1--2.5 m. tall, with pendent inflorescences, and have found it growing in cerrado and on streambanks, at altitudes of 600--1750 m., flowering from January to March, as well as in July and August, and fruiting in February. Irwin and his associates report it "common in open disturbed places in wooded valley" and "on hills with iron-rich 'canga' soil".

The corollas are said to have been "white" on Anderson 6940 and on Hatschbach & Ahumada 31325, "whitish" on Hatschbach & Ahumada 31606, "white, yellow in throat" on Irwin & al. 29679, and "white, the throat orange within" on Irwin & al. 29159.

Troncoso (1974) gives the geographic distribution of the species as "Brasil merid." and Misiones, Argentina. The Angely (1971) reference in the bibliography bears the incorrect titlepage date of "1970".

The Irwin, Harley, & Smith 31842, distributed in some herbaria as L. sidoides, actually is L. elegans Cham., while Philcox & Ferreira 4380 is L. matogrossensis Moldenke.

Additional citations: BRAZIL: Goiás: W. R. Anderson 6940 (Ld, N); Hatschbach 36927 (Ld). Maranhão: Eiten & Eiten 10730 (Z). Minas Gerais: Hatschbach 31606 (N, W--2706093); Hatschbach & Ahumada 31325 (Ld, N), 31606 (Ld); Irwin, Harley, & Onishi 28159 (Ld, N), 29679 (Ac, N, W--2758981); Martius s.n. [in ruderalis ad Lapucahy prope S. Barbara] (Mu--134), s.n. [in campis deserti retro fl. Jaquehinhonda] (Mu--133, Z); J. E. Pohl s.n. (Mu--135).

LIPPIA SIDOIDES f. FLACCIDA Hayek

Additional bibliography: Moldenke, Phytologia 12: 497. 1966; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 4: 836 & xi. 1971; Moldenke, Fifth Summ. 1: 157 (1971) and 2: 566 & 894. 1971.

As stated under other taxa in this series of notes, the Angely (1971) work bears an incorrect titlepage date of "1970".

LIPPIA SOMALENSIS Vatke

Additional & emended bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 278--280. 1900; Glover, Prov. Check List Brit. & Ital. Somal. 268. 1947; Dale & Greenway, Kenya Trees 588. 1961; Moldenke, Phytologia 12: 498. 1966; Glover, Stewart, Fumerton, Marindary, & Andersen, Gloss. Botan.-Kipsig. Names 256. 1969; Moldenke, Fifth Summ. 1: 213 (1971) and 2: 894. 1971; Moldenke, Phytologia 23: 420 & 421 (1972) and 39: 395. 1978.

LIPPIA STACHYOIDES Cham.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 266. 1858; Eiten in Ferré, Simpos. Sobre Cerrado 190. 1962; Moldenke, Phytologia 14: 417. 1967; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 4: 836 & xi, map 1387. 1971; Moldenke, Fifth Summ. 1: 157 (1971) and 2: 894. 1971; Moldenke, Phytologia 38: 386 (1978) and 39: 45. 1978.

Recent collectors describe this species as a tall herb or shrub, 0.4--2.5 m. tall, erect, with whorled leaves, and have found it growing on sandy campos, campo cerrado, and rocky hillsides, at altitudes of 615--1320 m., flowering in February, April, May, November, and December. Ratter and his associates encountered it "in grassy cerrado with scattered trees to 5 m. tall on very rocky soil". Anderson found it at the "edge of forest in area of cerrado sloping down to gallery forest through grassy brejo (sedge meadow), the brejo wet and seeping in some places, dry in others"; Sampaio found it "pouca, margem de correço". Eiten collected it on "slightly degraded campo cerrado with shrubs and trees to 4 m. tall twisted by former fires, forming an open thicket with the groundcover of grasses and herbs, the soil a poor dark reddish-brown sandy clay, in an area of campo cerrado on the uplands (or occasional forest) and open marsh or dense secondary forest along streams".

The corollas are said to have been "white" on Anderson 8658 and Sampaio 6829, "lilac" on Hatschbach & Koczik 33231, 33327, & 33377, "dark-purple" on Eiten 3557, "roxas" [rose] on Campos &

Lima 122-9572, and "vermelhas" [vermillion] on Mattos & Mattos 8540. This diversity in corolla color may indicate that two taxa are represented here. Certainly Anderson 8658 has bractlets which do not match well those seen on the other collections.

Eiten (1962) cites Eiten 1575 from cleared cerrado. Angely (1971) -- not "1970" as indicated on the titlepage -- records the species from Mato Grosso, Goiás, Minas Gerais, and São Paulo.

Material of L. stachyoides has been misidentified and distributed in some herbaria as L. glandulosa Schau., while Sampaio 6829 was distributed as and even cited by me in a previous (1965) publication as L. affinis Schau.

Additional & emended citations: BRAZIL: Goiás: Hatschbach & Koczicki 33327 (Ac). Mato Grosso: Hatschbach & Koczicki 33231 (Ld); Ratter, Bertoldo, Castro, Santos, & Souza R.913 (N). Minas Gerais: W. R. Anderson 8658 (Ld, N); Hatschbach & Koczicki 33377 (Gz). São Paulo: Campos & Lima 122-9572 (Ld); G. Eiten 3557 (Ld, N, W--2523077, W--2687532); Mattos & Mattos 8540 (W--2523076); Sampaio 6829 [Herb. Jard. Bot. Belo Horiz. 12307] (N). State undetermined: J. E. Pohl s.n. [in Brasilia] (Mu--136). MOUNTED ILLUSTRATIONS: Schau. in Mart., Fl. Bras. 9: pl. 37 I. 1851 (N, Z).

LIPPIA SUBRACEMOSA Mansf.

Additional bibliography: Fedde & Schust. in Just, Bot. Jahresber. 53 (1): 1074. 1932; Moldenke, Phytologia 12: 500--501. 1966; Moldenke, Fifth Summ. 1: 157 (1971) and 2: 568 & 894. 1971; Moldenke, Phytologia 31: 385. 1975; Hocking, Excerpt. Bot. A.28: 170. 1976.

Additional citations: BRAZIL: Bahia: Lützelburg 710 (Mu--isotype).

LIPPIA SUBRACEMOSA var. HARLEYI Moldenke, Phytologia 31: 232. 1975.

Bibliography: Moldenke, Phytologia 31: 232 & 385. 1975; Hocking, Excerpt. Bot. A.28: 170. 1976.

Citations: BRAZIL: Bahia: Harley, Renvoize, Erskine, Brighton, & Pinheiro in Harley 15834 (Z--type).

LIPPIA SUBSTRIGOSA Turcz.

Additional synonymy: Lippia substrigosus Turcz. ex Moldenke, Phytologia 36: 44, in syn. 1977.

Additional bibliography: Benth., Pl. Hartw. 80. 1841; Cummins, Lloydia 3: 16. 1940; Moldenke, Phytologia 14: 417. 1967; Uphof, Dict. Econ. Pl., ed. 2, 315. 1968; Moldenke, Résumé Suppl. 16: 3. 1968; Gibson, Fieldiana Bot. 24 (9): 207, 210, & 214--216, fig. 40. 1970; Lowden, Taxon 19: 23. 1970; Moldenke, Fifth Summ. 1: 70, 80, 82, 83, 85, & 86 (1971) and 2: 556, 557, 566, & 894. 1971; Moldenke, Phytologia 23: 415. 1972; Rouleau, Taxon Index Vols. 1-20 part 1: 216. 1972; Moldenke in Woodson, Schery, & al., Ann. Mo. Bot. Gard. 60: 67 & 147. 1973; Molina R., Ceiba 19: 96. 1975; Moldenke,

Phytologia 39: 26, 27, & 30. 1978.

Illustrations: Gibson, Fieldiana Bot. 24 (9): 215, fig. 40. 1970.

Recent collectors describe this species as a weak shrub "from a hard woody base", 1-3.5 m. tall, or a weak tree, 2--10 m. tall, the trunk to 4 inches in diameter, and the leaves viscid, and have found it growing on mountains and mountain slopes, shrubby or grassy slopes, and dry rocky hills, in pinelands, pine-oak forests, high forests, the edges of cloudforests, mossy secondary thickets, and deep ravines, and in mixed or wet mixed woods, pine forests, and open woods of Pinus pseudostrobus, at altitudes of 130--2700 meters, flowering from November to March, as well as in May and August, fruiting from January to March, as well as in August and November. Molina and his associates refer to the species as "frequent" or "common" in mixed or cutover mixed forests, "common along rivers", "common in clearings in forests", or "an herb 0.5-1 m." tall. The leaves on Molina & al. 15987 have unusually coarse teeth on the leaf-margins.

Breedlove encountered L. substrigosa in steep-walled ravines with seasonal evergreen forests of Quercus, Mastichodendron, Styrax, Oreopanax, and Bursera and on steep slopes with dense montane rainforest of Magnolia, Podocarpus, Calatola, and Ardisia. Ton found it growing on moist slopes with Quercus, Pinus chiapensis, Nyssa, Liquidambar, Dodonaea, and Calliandra and on shrubby slopes with Heliocarpus, Croton, and Erythrina. Anderson reports it "occasional in pine forests with some oaks and Liquidambar, the latter in the wetter places", while Williams and his associates refer to it as "scarce in pine forests" and "at junction of pine-oak forest and montane rainforest or cloudforest".

The corollas are said to have been "yellow" on Breedlove 23163 & 25269 and on Williams & al. 23036, "pale-yellow" on Molina & al. 20433 & 40675, "lemon-yellow" on Williams & al. 22256, 25133, & 25352, "bright-yellow" on Anderson & Anderson 5546, "greenish-yellow" on Williams & al. 41265, "yellowish" on Molina & al. 21503 & 24822, "cream-yellow" on Molina & al. 16228, "cream" on Grashoff 256 and Molina & al. 13498, 13580, & 15987, and "yellow and white" on Contreras 11008.

Vernacular names reported recently for the species are "chichigaste de venado", "oregano de árbol", "salvia santa", and "supup".

Bentham (1841) avers that the species is related to Lantana involucrata L. of the West Indies, but thus is not true. Uphof (1968) reduces L. substrigosa to synonymy under L. umbellata Cav., but this disposition is entirely erroneous. He also misspells the authority abbreviation "Turcs." Cummins (1940) reports that L. substrigosa is attacked by the fungus, Prospodium lippiae (Speg.) Arth., based on Holway 152, 730, & 787 and J. R. Johnston 358 & 611 from Guatemala. Gibson (1970) notes that "This plant has been

reported from Guatemala as L. umbellata Cav. and some of the material has been determined by Moldenke and cited by him as L. callicarpaefolia HBK. Lippia umbellata, which has been poorly understood and which probably includes L. pringlei Briq., was originally described (Cav. Icon. Pl. 2: 75, t. 194. 1792) as having 'flores umbellati, umbellis pluribus axillaribus in ramorum summitatibus' and the illustration clearly shows primary peduncles with several 'rays' forming definite dichasia. I have seen no material of L. umbellata nor the closely related L. pringlei from either Guatemala or Chiapas. The Mexican L. callicarpaefolia, which in foliage and large flowering heads does resemble L. substrigosa, differs markedly in its dichasial inflorescence and conspicuously colored (rose to purple) bracts." The collections to which she here refers which were erroneously cited by me in 1965 as L. callicarpaefolia are Hartweg 560 and Standley 69695.

Material of L. substrigosa has been misidentified and distributed in some herbaria as L. callicarpaefolia H.B.K., L. cardiostegia Benth., L. chiapasensis Loes., and L. umbellata Cav.

Additional & emended citations: MEXICO: Chiapas: Anderson & Anderson 5546 (Mi); Breedlove 9368 (Ld), 9476 (Ld), 23163 (Mi, N), 23952 (Ld), 25269 (N); R. M. Laughlin 401 (Ws); F. Miranda 5331 (W--2508388), 6110 (W--2508380), 6188 (W--2508372), 9164 (W--2508356); Ton 1543 (Mi, N), 1649 (Ld, Mi), 1705 (Ld, N), 1809 (N), 1905 (Mi, N), 2079 (Mi), 2129 (Ld, Mi, N), 3661 (Ld). GUATEMALA: Alta Verapaz: Molina R. & Molina 12116 (N); Türkheim 8441 (Mu--4032). Baja Verapaz: Contreras 11008 (Ld, Ld, W--2795347); P. C. Standley 69695 (N); Williams, Molina R., Williams, & Molina 40675 (N). Chimaltenango: Molina R., Burger, & Wallenta 16228 (N); Williams, Molina R., & Williams 25133 (N, W--2537530). El Quiché: Heyde & Lux 3024 (Mu--1771); Molina R. & Molina 25015 (N); Proctor 25472 (Ld, Ld). Guatemala: Molina R. 13498 (Ld, N); Molina R., Burger, & Wallenta 15987 (N); Molina R. & Molina 12389 (N); J. D. Smith 1888 (Mu--3868). Huehuetenango: Williams, Molina R., & Williams 22256 (N, W--2537592), 41265 (W--2740072). Jalapa: Kellerman 7910 (W--2442196), 8047 (W--2442713), s.n. [Geronimo, 3 Mar. 1907] (Ca--1228027). Quezaltenango: Grashoff 256 (Ln--221750); Hartweg 560 (Lu, N); Williams, Molina R., & Williams 23036 (N, W--2537588). Sacatepéquez: Molina R. & Molina 24822 (N). Santa Rosa: Heyde & Lux 4389 (Mu--1810). Sololá: Webster, Adams, Miller, & Miller 11821 (Ld); Williams, Molina R., & Williams 25352 (N). BELIZE: Hunt 409 (Ld). HONDURAS: Comayagua: Molina R. 13631 (N); Molina R. & Molina 25478 (N). Copán: Molina R. 11661 (Ld, N). Cortes: Molina R. 11448 (Ld, N). El Paraíso: Molina R. 11327 (N), 11365 (N), 11845 (N), 23386 (N). Intibucá: Molina R. & Molina 13931 (N). La Paz: Molina R. & Molina 24215 (Ld). Morazán: Molina R. 11290, 13580 (Ld, N); C. V. Morton 7551 (W--2023476); Williams & Molina R.

18950 (W—2572454), 18952 (W—2572455), 23231 (Ld, Se—213321).
 Ocotepeque: Molina R. 22237 (N), 24196 (N). EL SALVADOR: Santa Ana: Molina R. & Montalvo 21503 (N). NICARAGUA: Matagalpa: Molina R. 20433 (N); Williams, Molina R., & Williams 23910 (Ld); Williams, Molina R., Williams, Gibson, & Laskowski 27936 (N, W—2537791).

LIPPIA SUFRUTICOSA (Griseb.) Kuntze

Additional bibliography: R. C. Foster, *Contrib. Gray Herb.* 184: 170. 1958; Moldenke, *Phytologia* 14: 417—418. 1967; Moldenke, *Fifth Summ.* 1: 183 & 199 (1971) and 2: 555, 566, & 894. 1971; Troncoso, *Darwiniana* 18: 338 & 410. 1974.

Troncoso (1974) records this species from Bolivia and from the provinces of Salta and Tucumán in Argentina.

The Burkart 19390, distributed as L. suffruticosa, actually is L. recolletae Morong.

Additional citations: BOLIVIA: Cochabamba: M. Cárdenas 3837 (W—1909514); R. F. Steinbach 740 (S). ARGENTINA: Jujuy: O'Donell 2950 (N). Salta: Pierotti 1082 (N). Tucumán: Venturi 1789 (W—2562149).

LIPPIA TAYACAJANA Moldenke

Synonymy: Lippia tayacana Moldenke, *Biol. Abstr.* 48: 874, sphalm. 1967.

Additional bibliography: J. F. Macbr., *Field Mus. Publ. Bot.* 13 (5): 645 & 654. 1960; Moldenke, *Phytologia* 13: 368. 1966; Moldenke, *Biol. Abstr.* 47: 6792 & 6794 (1966) and 48: 874. 1967; Hocking, *Excerpt. Bot. A.11:* 104 & 450. 1967; Moldenke, *Résumé Suppl.* 16: 24. 1968; Moldenke, *Fifth Summ.* 1: 142 (1971) and 2: 566 & 894. 1971; Soukup, *Biota* 11: 14. 1976.

Macbride (1960) cites only Weberbauer 6510 & 7125 from Cajamarca and Huancavelica, Peru.

LIPPIA TAYACAJANA var. **SESSILIFLORA** Moldenke

Additional bibliography: Moldenke, *Phytologia* 13: 368. 1966; Moldenke, *Biol. Abstr.* 47: 6792. 1966; Hocking, *Excerpt. Bot. A.11:* 450. 1967; Moldenke, *Fifth Summ.* 1: 142 (1971) and 2: 894. 1971; Soukup, *Biota* 11: 14. 1976.

Additional citations: PERU: Cajamarca: Hutchison & Wright 7025 (N—isotype).

LIPPIA TEGULIFERA Briq.

Additional synonymy: Lippia tergulifera Briq. ex Moldenke, *Phytologia* 36: 44, in syn. 1977.

Additional & emended bibliography: Briq. in *Chod. & Hassl.*, *Bull. Herb. Boiss.*, ser. 2, 4: 1156. 1904; Briq. in *Chod. & Hassl.*, *Pl. Hassl'er.* 2: 492. 1904; Moldenke, *Phytologia* 13: 1—6. 1966; Moldenke, *Résumé Suppl.* 15: 5. 1967; Moldenke, *Fifth Summ.* 1: 157, 186, & 199 (1971) and 2: 567, 894, & 895. 1971; Troncoso, *Darwiniana* 18: 335, 340, & 410. 1974.

The corollas on Krapovickas & Cristóbal 28699 are said to have

been "yellow" and these collectors encountered the plant on high campos. Troncoso (1974) cites Pedersen 9516 in the San Isidro herbarium and records the species from Paraguay and the provinces of Corrientes and Misiones in Argentina.

The Fiebrig 429, distributed as typical L. tegulifera, seems better placed as var. ovata Briq.

Additional citations: ARGENTINA: Misiones: Krapovickas & Cristóbal 28699 (Z).

LIPPIA TEGULIFERA var. **GRISEA** Briq.

Additional bibliography: Moldenke, *Phytologia* 13: 3 & 4. 1966; Moldenke, *Fifth Summ.* 1: 186 (1971) and 2: 894. 1971.

LIPPIA TEGULIFERA var. **OVATA** Briq.

Additional bibliography: Moldenke, *Phytologia* 14: 418. 1967; Moldenke, *Résumé Suppl.* 15: 5. 1967; Moldenke, *Fifth Summ.* 1: 157, 186, & 199 (1971) and 2: 895. 1971.

Material of this taxon has been distributed in some herbaria as Lippia "tergulifera Briq."

Additional citations: PARAGUAY: Fiebrig 429 (Mu—4039).

LIPPIA TEGULIFERA var. **PEDUNCULATA** Briq.

Additional bibliography: Moldenke, *Phytologia* 13: 3—6. 1966; Moldenke, *Fifth Summ.* 1: 186 (1971) and 2: 895. 1971.

LIPPIA TEPICANA Moldenke

Additional bibliography: Moldenke, *Phytologia* 13: 368. 1966; Moldenke, *Fifth Summ.* 1: 72 (1971) and 2: 537, 559, & 895. 1971; Moldenke, *Phytologia* 38: 386 & 394. 1978.

Gentry & Gilly describe this species as an open-crowned shrub, 1.2—1.8 m. tall, and encountered it in a highly mixed tropical forest dominated by pine and oak on mountain slopes with clay soils volcanically derived, at 4000 feet altitude, flowering and fruiting in May.

Additional citations: MEXICO: Nayarit: Gentry & Gilly 10484 (Mi).

LIPPIA THYMOIDES Mart. & Schau.

Additional synonymy: Lippia micromera var. paludicola Moldenke, *Phytologia* 1: 468—469. 1940. Lippia thymoides Mart. ex Moldenke, *Phytologia* 36: 44, in syn. 1977. Lippia thymoides Schau., in herb.

Additional & emended bibliography: Buek, *Gen. Spec. Syn. Candoll.* 3: 266. 1858; Moldenke, *Phytologia* 1: 468—469 (1940), 12: 24 & 286—287 (1965), 13: 7—8 & 361 (1966), and 18: 210. 1969; Moldenke, *Fifth Summ.* 1: 156 & 157 (1971) and 2: 562, 893, & 895. 1971; Moldenke, *Phytologia* 31: 385 & 403. 1975; Hocking, *Excerpt. Bot.* A.28: 170. 1976.

Recent collectors describe this plant as an aromatic, straight-stemmed, brittle shrub, 1—2 m. tall, the leaves with a strong lavender odor, and the flowers pleasantly fragrant, and have found

it growing in caatinga, swamps, and among "vegetation cutover through cultivation", at 650—910 m. altitude, flowering in February, March, July, and November. The corollas are said to have been "white" on Castellanos 25101, Harley 16924, Santos 2508, and Travescoa 86, "pink" on Pinheiro 1412, "pale-pink with orange throat" on Harley 16813, and "rose, throat yellow" on Martius 1955.

The type of L. micromera var. paludicola Moldenke, matching perfectly the typical form of L. thymoides, is Blanchet 2872 from Bahia, Brazil.

Additional & emended citations: BRAZIL: Bahia: Blanchet 2872 (Br, Br, Br, Lu, M); A. Castellanos 25101 [Herb. Cent. Pesq. Florest. FEEMA 3870] (Ld, Z); Harley, Renvoize, Erskine, Brighton, & Pinheiro in Harley 16813 (Ac), 16924 (Ld); Martius 1955 (Mu--137--cotype, Mu--138--cotype, Z--cotype); Pinheiro 1412 (N); Santos 2508 (N); Travescoa 86 [Herb. Jard. Bot. Rio Jan. 86135] (N, W--2820637).

LIPPIA THYMOIDES var. MUCRONULATA Moldenke, Phytologia 31: 232. 1975.

Bibliography: Moldenke, Phytologia 31: 232 & 385. 1975; Hocking, Excerpt. Bot. A.28: 170. 1976.

Material of this taxon has been misidentified and distributed in some herbaria as L. micromera var. paludicola Moldenke.

Citations: BRAZIL: Bahia: Irwin, Harley, & Smith 30835 (Ld--isotype, N--type, W--2759081--isotype).

LIPPIA THYMOIDES var. TONSILIS (Moldenke) Moldenke, Phytologia 31: 232. 1975.

Synonymy: Lippia micromera var. tonsilis Moldenke, Phytologia 18: 210--211. 1969.

Bibliography: Moldenke, Biol. Abstr. 50: 7999. 1969; Moldenke, Phytologia 18: 210--211. 1969; Hocking, Excerpt. Bot. A.18: 444. 1971; Moldenke, Phytologia 31: 232, 385, & 403. 1975; Hocking, Excerpt. Bot. A.28: 170. 1976.

Harley and his associates describe this plant as a small, bushy, aromatic herb, with small flowers, the corollas being "mauve, with a yellow throat", and found it growing on a floodplain with riverine, chiefly herbaceous, weedy vegetation, at 980 m. altitude, flowering in January. Sobrinho reports the vernacular name, "alecrim verdadeiro", for it.

Citations: BRAZIL: Bahia: Harley, Renvoize, Erskine, Brighton, & Pinheiro in Harley 15625 (Z); Sobrinho 247 [Herb. Tavares 2050] (W--2541751--type, Z--isotype).

LIPPIA TORRESII Standl.

Additional bibliography: Moldenke, Phytologia 13: 368. 1966; Farnsworth, Pharmaceut. Titles 6 (9): vii & title 15746. 1971; Moldenke, Fifth Summ. 1: 85 & 91 (1971) and 2: 567 & 895. 1971;

Sáez R. & Nassar C., Revist. Biol. Trop. 18: 137. 1971; Farnsworth, Pharmacog. Titles 6, Cum. Gen. Ind. [69]. 1973; Moldenke in Woodson, Schery, & al., Ann. Mo. Bot. Gard. 60: 67, 72-73, & 147. 1973; Moldenke, Phytologia 31: 392 (1975) and 39: 36. 1978.

Recent collectors describe this species as a large or small weak tree, 5-20 m. tall, the stems thick, to 18 inches in diameter at breast height, the wood soft and light, the leaves very rugose, aromatic, and the bracts "blown by the wind", and have encountered it in wet woodland pastures, at the edge of roadside woods, on forested hills and potrerros, on lava fields and volcano slopes, on wooded slopes, and in woods on steep streambanks, open meadows with relics of montane forest, thickets along trails, cut-over forests, montane forests, and remnant montane rainforests, at altitudes of 1200-2770 m., flowering from December to February, fruiting from January to April. Wilbur and his associates refer to it as "occasional" in some regions and "common" in others. The vernacular name, "caragra", is recorded for it.

The corollas are said to have been "yellow" on Allen 1481, Croat 13650, Hatheway 1301, and Wilbur & al. 15187, "pale-yellow" on Wilbur & Teeri 13312, "greenish-yellow" on Allen 1565 and Wilbur & al. 10890 & 13682, "pale greenish-yellow" on Wilbur & al. 13276, "yellow-green" on Williams & al. 28912, and "cream" on Lems 5049. Jiménez M. describes the "flores centrales con boca amarilla, cabeza con bracteas centrales atropurpureas" on his 2944 and "flores amarillas con tubo blanco de 3-4 mm." on his 1424. He also describes the tree branches as "ramas oblicuas hacia arriba" and found the plant "en bosque ralo al borde del rio". Wood samples accompany Stern & al. 1997 and Stork 4590. The leaves and stems are said by Sáez R. & Nassar C. (1971) to be used for "el empalme".

Material of this species has been misidentified and distributed in some herbaria as L. umbellata Cav. On the other hand, the Lent 2633, distributed as L. torresii, actually is L. costaricensis Moldenke.

Additional citations: COSTA RICA: Alajuela: Jiménez M. 2944 (N, W-2537537); Williams, Molina R., Williams, & Gibson 28912 (N). Heredia: Hatheway 1301 (W-2512678); Lems 5339 (N); Wilbur & Teeri 13682 (Mi, N, W-2695691). San José: Jiménez M. 1424 (N); Lems 5049 (N); Madriñ AMV.41 (N); Pittier & Tonduz 1700 (Mu--3777); Stork 4590 (N); Wilbur & Stone 8833 (N). PANAMA: Chiriquí: P. H. Allen 1481 (E-1190784), 1565 (E-1190483); Croat 13650 (N); Stern, Eyde, & Ayensu 1997 [wood sample USW.33769] (E-1839666, Mi, W-2490056); Wilbur, Almeda, Luteyn, & Utley 15187 (Mi, N); Wilbur & Teeri 13276 (N, W-2695692), 13312 (Mi, N, W-2695694); Wilbur, Weaver, Foster, & Correa 10890 (Mi, N, W-2695693). CULTIVATED: Costa Rica: Madriñ 41 (N).

LIPPIA TRACHYPHYLLA Briq.

Additional bibliography: Angely, Fl. Anal. Paran., ed. 1, 576. 1965; Moldenke, Phytologia 13: 10--12 (1966) and 14: 410. 1967; Moldenke, Fifth Summ. 1: 183, 187, & 199 (1971) and 2: 567 & 895. 1971; Troncoso, Darwiniana 18: 340 & 410. 1974.

The corollas are said to have been "blue" on Luna 523, and the plant was collected in anthesis in December. Troncoso (1974) records it only from Paraguay.

Additional citations: ARGENTINA: Salta: Luna 523 (N).

LIPPIA TRISTIS Briq.

Additional & emended bibliography: Briq. in Chod. & Hassl., Fl. Hassler. 2: 495--496. 1904; Burkart, Excerpt. Bot. A.5: 586. 1962; Moldenke, Phytologia 14: 413. 1967; Moldenke, Fifth Summ. 1: 187 (1971) and 2: 546, 550, 567, & 895. 1971; Troncoso, Darwiniana 18: 340 & 410. 1974.

LIPPIA TRISTIS var. **ABERRANS** Briq.

Additional bibliography: Burkart, Excerpt. Bot. A.5: 586. 1962; Moldenke, Phytologia 13: 15--16. 1966; G. Taylor, Ind. Kew. Suppl. 14: 79. 1970; Moldenke, Fifth Summ. 1: 187 (1971) and 2: 549 & 895. 1971; Troncoso, Darwiniana 18: 340. 1974.

LIPPIA TROLLII Moldenke

Additional bibliography: G. Taylor, Ind. Kew. Suppl. 13: 81. 1960; Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 13: 16--17. 1966; Troncoso, Darwiniana 14: 637--638. 1968; N. F. Good, Biol. Abstr. 50: 9661. 1969; Moldenke, Fifth Summ. 1: 183 & 199 (1971) and 2: 895. 1971; Troncoso, Darwiniana 18: 337 & 410. 1974; Moldenke, Phytologia 31: 387. 1975; Anon., Biol. Abstr. 61: AC1.640. 1976; Hocking, Excerpt. Bot. A.28: 170. 1976.

The stems of the typical form of this species have distinct, Rosa-like, small, stiff, slightly recurved thorns. The plant has been collected at 1900 m. altitude. Troncoso (1968) cites Troll 1207 from Santa Cruz, Bolivia, in the Berlin herbarium, and Fabris 5250 from Jujuy, Argentina, in the San Isidro and La Plata herbaria.

Additional citations: BOLIVIA: Santa Cruz: Troll 1207 (Mu--isotype).

LIPPIA TROLLII var. **INERMIS** Moldenke, Phytologia 31: 26--27. 1975.

Bibliography: Moldenke, Phytologia 31: 26--27 & 387. 1975; Anon., Biol. Abstr. 61: AC1.640. 1976; Hocking, Excerpt. Bot. A.28: 170. 1976.

Citations: BOLIVIA: Santa Cruz: Troll 1054 (Mu--type, N--photo of type, Z--isotype, Z--photo of type).

LIPPIA TURBINATA Griseb.

Additional bibliography: Rojas Acosta, Cat. Hist. Nat. Corrient. 205. 1897; Reiche & Phil., Fl. Chil. 5: 298 & 301--302. 1910; Baez,

Anal. Asoc. Estud. Mus. Pop. Paraná 1920: 40. 1920; Baez, Mus. Entre Ríos Cart. Herb. Paran. 44. 1938; Fester & al., Anal. Soc. Cienc. Arg. 144: 457-471. 1945; Fester & al., Chem. Abstr. 42: 4309. 1948; Fester & Martinuzzi, Anal. Asoc. Quim. Argent. 40: 36-60. 1952; Fester & Martinuzzi, Chem. Abstr. 46: 11586-11587. 1952; Fester & al., Rev. Fac. Ind. & Agr. Univ. Nac. Litoral. Santa Fe Argent. 21/22: 43-84. 1953; Fester & al., Chem. Abstr. 48: 6655-6656. 1954; Karrer, Konstit. & Vork. Organ. Pflanzenst. 32. 1958; J. F. Macbr., Field Mus. Publ. Bot. 13 (5): 645, 649, & 655. 1960; Fester, Martinuzzi, Retamar, Ricciardi, Romero Fonséca, & Cassano, Revist. Fac. Cienc. Agrar. Mendoza 8 (2): 47. 1961; J. A. Clark, Card-Ind. Gen. Spec. & Var. Pl. issue 245. 1965; Hocking, Excerpt. Bot. A.9: 367. 1965; Schubert, Assoc. Trop. Biol. Bull. 4: 73. 1965; Troncoso in Cabrera, Fl. Prov. Buen. Aires 5: 145 & 147. 1965; Y.-R. Naves, Helv. Chim. Act. 49: 2012-2016. 1966; Anon., Biol. Abstr. 48 (13): S.97. 1967; Moldenke, Phytologia 14: 418. 1967; Y.-R. Naves, Biol. Abstr. 48: 5958. 1967; Moldenke, Résumé Suppl. 17: 7 & 11. 1968; Farnsworth, Blomster, Quimby, & Schermerh., Lynn Ind. 6: 266. 1969; Leondo Montes, An. Soc. Cienc. Argent. 187: 21-48. 1969; Rondina & Coussio, Rev. Invest. Agropec. INTA Buen. Aires, ser. 2, Biol. Prod. Veg. 6 (22): 351, 365, & 366. 1969; Farnsworth, Pharmacog. Titles 5 (5): v & item 4563. 1970; Willaman & Li, Lloydia 33, Suppl. 32: 220. 1970; Farnsworth, Pharmacog. Titles 5, Cumul. Gen. Ind. 1971; Farnsworth, Pharmacog. Titles 6 (1): ix & title 932 (1971) and 6 (8): xi & title 14235. 1971; Heusser, Pollen & Spores Chile 61, pl. 57-666. 1971; Moldenke, Fifth Summ. 1: 142, 192, 199, & 366 (1971) and 2: 550, 553-555, 560, 563, & 895. 1971; Bandoni, Mendiondo, Rondina, & Coussio, Phytochem. 35: 69, 71, & 77. 1972; Farnsworth, Pharmacog. Titles 7 (8): xvi & item 16598. 1972; Farnsworth, Pharmacog. Titles 6, Cumul. Gen. Ind. [69]. 1973; Hegnauer, Chemotax. Pfl. 6 [Chem. Reihe 21]: 661 & 668. 1973; Moldenke, Phytologia 28: 450. 1974; Troncoso, Darwiniana 18: 335, 338, & 410. 1974; Moldenke, Phytologia 31: 387. 1975; Soukup, Biota 11: 14. 1976; Otte & Joern, Proc. Acad. Nat. Sci. Philad. 128: 103. 1977; Moldenke, Phytologia 38: 399 (1978) and 39: 89 & 98. 1978.

Additional illustrations: Troncoso, Darwiniana 10: 82. 1952; Heusser, Pollen & Spores Chile pl. 56-666. 1971.

Recent collectors refer to this plant as a shrub, 1.5 m. tall, and have found it growing at 1500-1700 m. altitude, flowering in January and November, fruiting in November. The corollas are said to have been "white" on Terribile 799. Troncoso (1965) reports the plant as "medicinal" in Buenos Aires. She records it from Atacama in Chile and from Córdoba, San Juan, and San Luis in Argentina, citing Burkart 7492 from Córdoba and Werdermann 474 from Atacama, both deposited in the San Isidro herbarium. She notes (1952) that the leaves may sometimes vary to obovate, the bracts smaller, ovate, and apiculate, and the heads geminate, but the significance of these variations had not been determined by her as of that date. Macbride (1960) records the species from Tacna

(Peru), Chile, and Argentina.

Heusser (1971) describes the pollen grains as "Monad, isopolar, radiosymmetric; tricolporate, tetracolporate (stephanocolporate), or pericolporate, colpi long and generally narrow, at times constricted, their membranes granular, pores transverse, distinct, generally long and narrow but also becoming relatively broad-elliptic; mostly oblate spheroidal, amb subtriangular or more or less tetragonal; exine 2 mu or less thick, faintly tectate, foveolate; 25--28 x 25--31 mu."

Fester and his associates (1945, 1948, 1952--1954) report the presence in this species of d-limonene, phenols, ketones, aldehydes, sesquiterpenes, cineole, and lippione in a volatile oil of the leaves. Karrer (1958) found limonene, C₁₀H₁₆, in this species as well as in such diverse and unrelated other species as Chamaecyparis obtusa, Citrus nobilis var. deliciosa, Cymbopogon polyneuros, Dacrydium kirkii, Litsea cubeba, Pittosporum tenuifolium, Seseli indicum, Siler trilobum, and Solidago odora. Naves (1966) reports diosphenolene (lippiaphenol).

Material of L. turbinata has been misidentified and distributed in some herbaria as L. chilensis Schau. [=Aloysia salviaefolia (Hook. & Arn.) Moldenke]. On the other hand, the Balegno 330, Krapovickas 6612, Krapovickas & Cristóbal 14659, and Lossen 221, distributed as typical L. turbinata, seem better placed as L. turbinata f. angustifolia Osten, while P. Garcia 956 is L. turbinata f. magnifolia Moldenke, Cabrera & Fabris 13247 is L. grisebachiana Moldenke, Cabrera, Solbrig, Torres, & Vuillemier 16700 is L. integrifolia (Griseb.) Hieron., and O'Donell & Rodriguez 242 is Aloysia gratissima (Gill. & Hook.) Troncoso.

Additional citations: ARGENTINA: Buenos Aires: Tweedie s.n. [Bahia Blanca] (Pd). Catamarca: Brizuela 89 (N), 744 (Ms--34192), s.n. [12-III-1947] (N); O'Donell & Meyer 5143 (N); Reales 830 (N), 939 (N), 1143 (N); Villafañe 1197 (N). Córdoba: Lorentz 86 [Macbride photos 20336] (Mu--1407--type, Z--isotype); Meebold 7 (Mu); Pastore 340 (W--2595169); Ruiz Huidobro 41 (N); Varela 408 (Ut--330583B); Villafañe 4 (Tu--77306), 553 (N). Mendoza: Krapovickas & Cristóbal 14612 (Ld, Ws); Ruiz Leal 8507 (Tu--155516), 17670 (Tu--162099). Salta: T. Meyer 8337 (N); Ruiz Huidobro 513 (Ut--330552B); Sotelo 868 (N). San Luis: Báez 1 (W--2567990); Semper s.n. [20--27-II-1944] (N); Varela 494 (N). Santiago del Estero: T. Meyer 12733 (N); O'Donell 4235 (N); Terribile 799 (N). CULTIVATED: Egypt: Hadidi & Ghabbour s.n. [1/7/1967] (Gz); Mahdi s.n. [1/10/1963] (Gz, Gz), s.n. [27/7/1963] (Gz, Gz); Sisi s.n. [26/5/1973] (Gz, Gz); V. Täckholm s.n. [2/11/1959] (Gz).

LIPPIA TURBINATA f. ANGUSTIFOLIA Osten

Additional bibliography: Moldenke, *Phytologia* 14: 418. 1967; Moldenke, *Fifth Summ.* 1: 192 & 199 (1971) and 2: 895. 1971; Molden-

ke, Phytologia 31: 387. 1975.

Recent collectors describe this plant as a shrub, 1.5 m. tall, and have found it growing at the edges of railroad rights-of-way, flowering and fruiting from December to February. They record the vernacular name, "poleo". The corollas are said to have been "white" on Krapovickas & Cristóbal 14659 and on Ruiz Huidobro 84. The latter collection is a mixture with Aloysia gratissima (Gill. & Hook.) Troncoso.

Material of this form has been distributed in many herbaria as typical L. turbinata Griseb.

Additional citations: CHILE: Atacama: Zöllner 6994 (Ac). ARGENTINA: Córdoba: Balegno 330 (N), 1493 (N); Krapovickas 6612 (S); Krapovickas & Cristóbal 14659 (Ld); Lossen 221 (Mu—4357); Ragonese & Piccinini 6148 [Herb. Inst. Bot. 69275] (Ba); Ruiz Huidobro 84 in part (N); Villafañe 114 (N), 375 (N). San Juan: Fabris & Marchionni 2415 (Mu, Mu). LOCALITY OF COLLECTION UNDETERMINED: Herb. Monac. H.75 (Mu).

LIPPIA TURBINATA f. MAGNIFOLIA Moldenke

Additional bibliography: Cabrera, Bol. Soc. Argent. Bot. 5: 96. 1953; J. A. Clark, Card-Ind. Gen. Sp. & Var. Pl. issue 245. 1965; Schubert, Assoc. Trop. Biol. Bull. 4: 73. 1965; Moldenke, Phytologia 14: 418. 1967; Moldenke, Résumé Suppl. 17: 7 & 11. 1968; Moldenke, Fifth Summ. 1: 199 & 366 (1971) and 2: 554 & 895. 1971; Troncoso, Darwiniana 18: 338 & 410. 1974.

Recent collectors describe this plant as a spreading subshrub with rigid branches arising at an angle of about 30° above the horizontal. The corollas are said to have been "white" on Brizuela 195 and García 937 & 958, "mauve or whitish" on Sykes 23/67, and "lilac" on Cuezzo 25 and Herrera 72. Cabrera (1953) and Troncoso (1974) record the form from Jujuy, Salta, and Tucumán, Argentina. Luna Risso 663 differs in having small leaves, but the blades are broadly elliptic or obovate and mucromulate, the leaves and inflorescences both mostly ternate.

The Cuezzo 25, García 958, and O'Donell 2514 & 2548, cited below, were previously (1966) mis-cited by me as typical L. turbinata.

Additional & emended citations: ARGENTINA: Buenos Aires: Ruiz Huidobro 1388 (N). Catamarca: Brizuela 195 (N), 606 (N), 684 (N); Pierotti "h" [18/V/44] (N); Reales 1146 (N). Córdoba: T. Meyer 12914 (N); Ruiz Huidobro 451 (Ut—330554B). Mendoza: Ruiz Leal 8507 (Ut—220553B). Salta: Herrera 72 (N); F. E. Luna 172 (N); Luna Risso 663 (N); B. Malvárez 180 (N); O'Donell 2514 (Ca—165621, N), 2548 (Ca—164813, N), 2732 (N, N), 5347 (N), 5370 (N); Ruiz Huidobro 618 (Ut—220565B). Santiago del Estero: P. García 937 (N), 958 (Ca—1166982, N); F. E. Luna 265 (N), 1179 (N), 1201 (N). Tucumán: Cuezzo 25 (N, S). CULTIVATED: New Zealand: W. R. Sykes 23/67 [Herb. Bot. Div. D.S.I.R. 176287] (Z).

LIPPIA TURNERIFOLIA Cham.

Additional & emended bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 266. 1858; Briq. in Chod. & Hassl., Bull. Herb. Boiss., ser. 2, 4: 1157—1159. 1904; Briq. in Chod. & Hassl., Pl. Hassler. 2: 493—495. 1904; R. C. Foster, Contrib. Gray Herb. 184: 170. 1958; Angely, Fl. Anal. Paran., ed. 1, 576. 1965; Martínez-Croveto, Bonplandia 2: 41, 52, 59, & 63. 1965; Dombrowski & Kuniyoshi, Araucariana 1: 14. 1967; Moldenke, Phytologia 14: 418. 1967; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 4: 836 & xi, map 1387. 1971; Moldenke, Fifth Summ. 1: 157, 183, 187, 189, & 199 (1971) and 2: 545, 567, & 895. 1971; Moldenke, Phytologia 25: 229. 1973; Troncoso, Darwiniana 18: 335, 340, & 410. 1974; Moldenke, Phytologia 38: 263 & 479 (1978) and 39: 180. 1978.

Recent collectors describe this species as an herb or shrub, 70 cm. tall, the stems 1 or a few, rising from a thick root or xylopodium, and have encountered it on campos, high or dry campos, rocky campos, campo limpo, cerrado and burned-over cerrado, at lakesides, along campo roadsides "where sods have been cut", burned roadsides, and in ruderal grassland on hills, at altitudes of 800—1000 m., flowering from September to December as well as in March and April, fruiting in October. Lindeman & Haas found it growing "on campo near border of planalto". Arbo and his associates encountered it on "taipas". Irwin & Soderstrom refer to it as "locally common".

The corollas are said to have been "yellow" on Arbo & al. 1000, Hatschbach 17314, 30636, 33436, 33574, 37731, & 39173, Hatschbach & Kummrow 34963, Hatschbach & Scherer 30403, Krapovickas & al. 16661, Kummrow 42 & 637, Lima & al. ICN.20990, Quarin & al. 2712, and Schinini 8728, "yellow (5Yb/12)" on Lindeman & Haas 20, "golden-yellow" on Lourteig 1909, "inside yellow (2 1/2Y8/10), outside pale (2 1/2 Y8/12) on Lindeman & Haas 2528, "yellow, red-orange at center" on Irwin & Soderstrom 7290, "amarillas y rojizas" on Krapovickas & al. 26396, "orange" on Schwarz 6022, and "orange (10YR7/10)" on Lindeman & Haas 2461.

Angely (1971) records this species from Paraná, Rio Grande do Sul, Santa Catarina, and São Paulo, Brazil -- his work bears the incorrect titlepage date of "1970". Briquet (1904) appears to list as synonyms of *L. turnerifolia* Cham. the *L. turneraefolia* Chod. and *L. turnerifolia* Chod., but I relegate both of these homonyms to the synonymy of *L. tristis* Briq.

Troncoso (1974) makes *L. turnerifolia* the type species of a Section *Dioicolippia* Troncoso. She cites Dombrowski 1967 from Paraná, Brazil, and Cano & Hernández 616 from Corrientes, Argentina, both in the San Isidro herbarium. Hatschbach & Scherer 30403 is a mixture with *L. asperrima* Cham.

Material of *L. turnerifolia* has been misidentified and distributed in some herbaria as *L. morongii* Kuntze. On the other hand, the Herter 989 [Herb. Herter 82594], distributed as *L. turnerifolia*

ia, actually is L. morongii Kuntze.

Additional citations: BRAZIL: Goiás: Hatschbach & Kummrow 34963 (Ld); Irwin & Soderstrom 7290 (N, N, N). Mato Grosso: Hatschbach & Scherer 30403 in part (Ld, W--2706682). Paraná: Hatschbach 17413 (Ld), 30636 (Ld), 32731 (Ld), 33436 (Ac), 33574 (Gz), 39173 (Ld); Jönsson 35a (Mu); Kummrow 42 (Kh), 637 (Ld); Lindeman & Haas 20 (Ld), 2461 (Ut--320424), 2528 (Ld), 3251c (Ut--320444); Van der Veen 31 (Ut--320419). Rio Grande do Sul: Lima, Vianna, Irgang, & Ferreira ICN.20990 (Ut--320442); Rambo 53437 (B); Sellow s.n. [Brasilia, 17.9.1828; Macbride photos 34333] (W--photo of type). PARAGUAY: Lourteig 1909 (N); Woolston 130 (N). ARGENTINA: Corrientes: Arbo, Schinini, Ahumada, O. de Coll, & Vanni 1000 (Ac), 1061 (Ld); Krapovickas, Cristóbal, Arbo, Maruffak, Maruffak, & Irigoyen 16661 (Ws); Quarín, Schinini, & González 2712 (Ld); Schinini 8728 (Ld). Misiones: Krapovickas, Cristóbal, Maruffak, Pire, & Tressens 15282 (Ld); Montes 14869 (Au--271296, Ld, N, W--2556005); Schwindt 189 (N); G. J. Schwarz 5864 (N), 6022 (N).

LIPPIA TURNERIFOLIA var. ANGUSTA Kuntze

Additional & emended bibliography: Briq. in Chod. & Hassl., Pl. Hassler. 2: 494. 1904; Moldenke, Phytologia 13: 29--31. 1966; Moldenke, Fifth Summ. 1: 187 (1971) and 2: 567 & 895. 1971.

The corollas on Schinini 4307 are said to have been "yellow-orange" when fresh and this collector found the plant in flower in March.

Additional citations: PARAGUAY: Schinini 4307 (Z).

LIPPIA TURNERIFOLIA var. SESSILIFOLIA Moldenke

Synonymy: Lippia turnerifolia var. sessilifolia Moldenke, Llyodia 13: 224, sphalm. 1950.

Additional bibliography: Moldenke, Phytologia 13: 31. 1966; Moldenke, Fifth Summ. 1: 157 (1971) and 2: 567 & 895. 1971.

LIPPIA UKAMBENSIS Vatke

Additional & emended bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 278 & 281. 1900; Dale & Greenway, Kenya Trees 588. 1961; J. A. Hutchins., Journ. Tangan. Soc. 64: 105. 1965; Moldenke, Phytologia 14: 409 & 418--419. 1967; Glover, Stewart, Fumerton, Marindary, & Andersen, Gloss. Botan.-Kipsig. Names 160 & 256. 1969; Moldenke, Fifth Summ. 1: 237 & 241 (1971) and 2: 895. 1971; Moldenke, Phytologia 39: 106 & 395. 1978.

Recent collectors describe this species as an upright branched shrub; 6--8 feet tall, "coppice-growing", the sap colorless, the flower-heads "yellow-greenish", the flowers not fragrant, and have found it growing along forest roadsides and in riverside thickets on black loam soil, at altitudes of 4500--5375 feet, flowering in November. The corollas are said to have been "white" on Tanner 1862. The vernacular name, "mwokyot", is recorded for it [as it

is also for L. javanica (Burm. f.) Spreng.] by Glover and his associates (1969).

Baker (1900) cites only the type collection, Hildebrandt 2739, from what was then British East Africa. Dale & Greenway (1961) reduce both L. kituiensis Vatke and L. schliebeni Moldenke to synonymy here, a disposition with which I do not concur.

Additional citations: TANZANIA: Tanganyika: Tanner R.T.1862 (Ba, N). KENYA: Perdue & Kibuwa 8033 (Mu).

LIPPIA UMBELLATA Cav.

Additional bibliography: Pers., Sp. Pl. 3: 352. 1819; Schau., Linnaea 20: 480. 1847; Buek, Gen. Spec. Syn. Candoll. 3: 266. 1858; Goyena, Fl. Nicarag. 1: 561. 1911; Roys, Ethno-bot. Maya [Tulane Univ. Mid. Am. Res. Ser. Publ. 2:] 296 & 322. 1931; M. Martínez, Pl. Medic. Mex., ed. 1, 424 & 621 (1933) and ed. 2, 426 & 608. 1939; Cummins, Lloydia 3: 16. 1940; Gómez Pompa, Estud. Bot. Reg. Misantla 93. 1966; Rzedowski & McVaugh, Contrib. Univ. Mich. Herb. 9: 70 & 107. 1966; Moldenke, Biol. Abstr. 47: 7190 (1966) and 48: 874. 1967; Hocking, Excerpt. Bot. A.11: 104 & 504. 1967; Moldenke, Phytologia 14: 419. 1967; Hocking, Pharmaceut. Abstr. 9 (3): no. 1067. 1968; Moldenke, Biol. Abstr. 49: 4199. 1968; Palacios Ch., Anal. Esc. Nac. Cienc. Biol. 16: 89, fig. 285 & 286. 1968; Uphof, Dict. Econ. Pl., ed. 2, 315. 1968; Harley & Kunitomo, Bull. Entomol. Res. 58: 787-792. 1969; M. Martínez, Pl. Medic. Mex., ed. 5, 460 & 639. 1969; A. L. Moldenke, Phytologia 18: 123. 1969; "E. M. D.", Biol. Abstr. 51: 1076. 1970; Gibson, Fieldiana Bot. 24 (9): 216. 1970; J. Rzedowski, Anal. Esc. Nac. Cienc. Biol. 18: 94 & 97. 1970; Moldenke, Fifth Summ. 1: 72 (1971) and 2: 543, 563, & 895. 1971; Altschul, Drugs & Foods 244. 1973; Troncoso, Darwiniana 18: 339 & 410. 1974; Hinton & Rzedowski, Anal. Esc. Nac. Cienc. Biol. 21: 75. 1975; Moldenke, Phytologia 38: 475 & 477 (1978) and 39: 253, 256, & 442. 1978.

Additional illustrations: Palacios Ch., Anal. Esc. Nac. Cienc. Biol. 16: fig. 285 & 286. 1968.

Recent collectors describe this plant as a shrub, 2-4 m. tall, or a small tree, 6-8 m. tall, aromatic, the trunk to 7 cm. in diameter, the leaves aromatic, and the flowers small, in heads, with the odor of menthol, and have found it growing in mesophytic, pine, or oak woods, oak-pine forests, disturbed oak woods, pine-fir forests, Cupressus-Quercus or Quercus-Liquidambar woods, woods of Quercus and Arbutus, and on basaltic slopes with mesophytic oak vegetation, at altitudes of 2025-2850 m., flowering from October to February, fruiting in January, February, October, and November. McVaugh refers to it as "scarce in pine forests mostly on rolling summits with pine, fir, and oak on the precipitous slopes". Rzedowski encountered it on "ladera tobosa con vegetación de encinar".

The corollas are said to have been "yellow" on Palacios s.n. and on Rzedowski 26935 & 28020, "yellowish" on Rzedowski 26456 & 28722, "greenish-yellow" on Hinton 15706, "yellow or fawn" on Hinton 13550, "yellow-green or white" on Hinton 11910, and "greenish"

on McVaugh 26122.

Common names reported by recent collectors are "cominos rusticos", "hierba de mula", "hierba de la mula", "juanislama del monte", "nacare", "old-woman's staff", "salvia", "salvia poblana", "tabaquillo", "tobaquillo", "toposana", "topozana", "xolte nuc", "xolte-xnuk", "xolté-x-nuc", and "yerba de Santa Gertrude".

Troncoso (1974) makes L. umbellata the type species of Section Rhodolippia Schau., a section of 9 or 10 species which she characterizes as having "Cabezuelas 'lupulinas', por lo general globosas. Brácteas grandes, anchamente ovales o redondeado-cordadas, membranáceas, coloreadas, venoso-reticuladas, que cubren y ocultan las corolas". The included species are found from Mexico to Brazil, principally in Brazil.

Palacios (1968) describes the pollen as follows: "Granos: tricolporados, tectados, subprolatos o esferoidales, de 31 (37) 39 μ x 31 (34) 38 μ . Vista polar inter-hexagonal, con un diámetro de 31 (36) 39 μ . Exina: 2.5 μ de grosor; elementos de la columela imperceptibles, superficie psilada. Surcos: de 18 (22) 25 μ de longitud x 2.5 μ de fisura, con terminaciones agudas y constreñidos en el ecuador. Surcos Transversales: de 17 μ de largo x 2.5 μ de fisura, con terminaciones agudas y situados en el centro de los colpas."

Uphof (1968) regards L. substrigosa Turcz., L. pringlei Briq., and L. chiapasensis Loes. as synonyms of L. umbellata, but I regard them all as abundantly distinct taxa. Cummins (1940) records the fungus, Prospodium lippiae (Speg.) Arth., as attacking Lippia umbellata in Guatemala, based on Holway 554. The beetle, Plagiohammus spinipennis (Thoms.), is also said to feed on it. Gibson (1970) comments: "Lippia umbellata, which has been poorly understood and which probably includes L. pringlei Briq., was originally described (Cav. Icon. Pl. 2: 75, t. 194. 1792) as having 'flores umbellati, umbellis pluribus axillaribus in ramorum summitatibus' and the illustration clearly shows primary peduncles with several 'rays' forming definite dichasia. I have seen no material of L. umbellata nor the closely related L. pringlei from either Guatemala or Chiapas." Actually, most of the material now regarded as true L. umbellata does not show branched or dichasial inflorescences.

Altschul (1973) reports a decoction made from L. umbellata is used to treat rheumatism, while Martínez (1969) says that in Durango it is used to treat colic. Roys (1931) says: "L. umbellata is a shrub or tree, reported from Izamal as 10 feet high. The flowers are yellowish, turning red....With it they cure night-fevers, especially in the case of babies....The Maya text prescribes an infusion of the crushed leaves as a remedy for dysentery accompanied by mucus or pus in the stools."

The Stern, Eyde, & Ayensu 1722 [wood voucher USw.33585], distributed as L. umbellata, actually is L. americana f. pilosa Moldenke, while Hinton 12945 is L. callicarpaefolia H.B.K.; Heyde &

Lux 4387 is L. controversa Moldenke; N. L. H. Krauss 585, Lathrop 5055, H. E. Moore 2000, and Weber & Charette 11939 are L. myrioccephala var. hypoleia (Briq.) Moldenke; Cummins 70-220H, Ernst 2446, 2476, & 2558, Herb. Zuccarini s.n. [h. Monac. 1835], s.n. [Hortus bot. Monacensis], & s.n. [Hortus Monac. anno 1845], Hinton 12949 & 13614, Karwinski s.n. [Hab. in Mexico], Kruse 55, Kummer s.n. [Hort. Monac. 1839.3.I], T. MacDougall H.284, J. G. Ortega 5707 & 6548, K. Reiche 1029, J. Rzedowski 19280, and Smith 193 are L. pringlei Briq.; Heyde & Lux 3024 & 4389, J. D. Smith 1888, Türckheim 8441, and Webster, Adams, Miller, & Miller 11821 are L. substrigosa Turcz.; and Pittier & Tonduz 1700 and Stern, Eyde, & Ayensu 1997 [wood voucher USw.33769] are L. torresii Standl.

Additional citations: MEXICO: Federal District: Bourgeau 968 (Mi, N, S, W--2546645); J. Rzedowski 21961 (Au--249300, Ip). Jalisco: R. McVaugh 10070 (Au--236037, Ld, N), 26122 (Mi). México: J. Rzedowski 26456 (Ld, Mi, Ws), 28020 (Ld, Mi, N), 28722 (Au--303720, Mi). Michoacán: Hinton 11910 (Se--97681, Tu--112038), 12791 (Se--37682), 13550 (Se--97680, Tu--112096), 15706 (Se--97686, Tu--112088); King & Soderstrom 5161 (Au--207071); Pringle 3948 (Ld, Ms--30883, Mu--3880, Tu--98615). Morelos: Lyonnet 3157 (W--2636379); Palacios s.n. [17/X/1964] (Ip, Ip), s.n. [14/XI/1964] (Ip, Ws); J. Rzedowski 26935 (Mi).

LIPPIA VELUTINA Schau.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 266. 1858; Moldenke, Phytologia 14: 419. 1967; Moldenke, Fifth Summ. 1: 157 (1971) and 2: 560 & 895. 1971; Moldenke, Phytologia 39: 261, 263, & 455. 1978.

Recent collectors describe this plant as a shrub, 1--2 m. tall, and have found it growing along roadsides and the margins of gallery woods, at 1200--1450 m. altitude, flowering in February, April, and November. Anderson encountered it at the edge of the forest in an area of gallery forest, adjacent sedge meadows and "campo sujo" with rocky campo on the higher drier slopes. The corollas are said to have been "white" on Anderson 8411, "whitish" on Hatschbach & Pelanda 27828, and "cream, the tube yellow" on Irwin & al. 20687.

The Philcox & Freeman 4736, Ratter, Bertoldo, Castro, Santos, & Souza R.904, and Ratter, Santos, Souza, & Ferreira R.1357, distributed as L. velutina, actually are L. obscura Briq.

Additional citations: BRAZIL: Goiás: J. E. Pohl s.n. [in Brasilia] (Mu--146--cotype). Mato Grosso: Silva Manso s.n. [Morro do Ernesto; Herb. Martius 1024; Macbride photos 7861 & 24676] (Mu--145--cotype, Z--cotype). Minas Gerais: W. R. Anderson 8411 (Ld, N); Hatschbach & Pelanda 27828 (Ld); Irwin, Maxwell, & Wasshausen 20687 (N, Z).

LIPPIA VERNONIOIDES Cham.

Emended synonymy: Lippia hirsuta var. vernonioides (Cham.)

Kuntze apud R. C. Foster, Contrib. Gray Herb. 184: 170. 1958.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 266. 1858; R. C. Foster, Contrib. Gray Herb. 184: 170. 1958; Moldenke, Phytologia 14: 419. 1967; Angely, Fl. Anal. Fitogeogr. Est. S. Paulo, ed. 1, 4: 836 & xi. 1971; Moldenke, Fifth Summ. 1: 157, 183, & 387 (1971) and 2: 551, 552, 556, & 895. 1971; Moldenke, Phytologia 27: 67. 1973; Moldenke, Biol. Abstr. 57: 3780. 1974; Moldenke, Phytologia 28: 439, 440, & 459. 1974; Troncoso, Darwiniana 18: 338 & 410. 1974.

Close inspection of the material presently passing as L. vernonioides reveals that two taxa are involved. In the typical form of the species the pubescence is persistently divergently stiff-hirsute, while in var. attenuata (Mart.) Moldenke it is more or less appressed and usually shorter. I have re-examined and re-annotated the material in the New York herbarium (including the Columbia University, Princeton University, and College of Pharmacy herbaria), but that in other herbaria remains to be re-examined.

Recent collectors describe this plant as an herb or subshrub, 0.5--2 m. tall, erect, the inflorescences or heads white or greenish-white, and have found it growing on grassy campos and in gallery forests, at altitudes of 400--900 m., flowering from April to July, fruiting from April to June. Hatschbach encountered it on "campo cerrado encosta rochosa de morro", while Irwin and his associates report it from "cerrado with 'cascalho' soil".

Troncoso (1974) makes this species the lectotype of Subsection Paniculatae (Schau.) Briq. in Series Paniculatae Schau., characterizing the subsection as having "Cabezuelas subglobosas pedunculadas, agrupadas en inflorescencias terminales racimoso-paniculadas."

Angely (1971) records the species from Pará, Maranhão, Mato Grosso, Goiás, Minas Gerais, and São Paulo, but all of the material which I have re-examined from Pará and Maranhão proves to be var. attenuata. As stated under other taxa in this series, his book is misdated "1970" on its titlepage.

The corollas of L. vernonioides are said to have been "white" on Irwin & al. 16696 & 17924, "whitish" on Hatschbach 32062 & 34730, "white with a yellow throat" on Ratter & al. 1588, "white with yellow center" on Steinbach 7027, "white, yellow on inside of tube" on Hatschbach 31969, and "whitish, interior of tube yellow" on Hatschbach 32062.

The following collections, distributed as L. vernonioides and in most cases so cited by me in a previous (1966) publication, prove to represent var. attenuata (Mart.) Moldenke: Cárdenas 1935 & 2028, Duarte 778, Hatschbach & Ahumada 31228, Herb. Brad. 28163, Herb. Inst. Agr. Est. S. Paulo 3764, Herb. Inst. Biol. S. Paulo 17475, 20411, & 41982, Herb. Jard. Bot. Rio Jan. 58834, Hoehne

2709, s.n., & Com. Rondon 1304, Hoehne & Gehrt s.n. [Turvo, April 24, 1926], Hunt 5540, Hunt & Ramos 5540, Irwin, Souza, Grear, & Reis dos Santos 17537, Kiehl s.n., Kuntze s.n. [Velasco, VII.92] & s.n. [Yapacani, 6.92], Macedo 2288, Martius 87 & 224, Mendes Magalhães 19025, Mosén 4319, Murça Pires 2361, Murça Pires & Black 2146, 2319, & 2361, Paredo s.n. [6-XII-1946], Riedel & Lund 2073, Rusby 926 & 927, and Steinbach 5581.

Additional citations: BRAZIL: Goiás: Irwin, Souza, Grear, & Reis dos Santos 17924 (Ac, N). Mato Grosso: Hatschbach 31969 (Z), 34730 (Ld); Hatschbach & Guimarães 21895 (Ac); Irwin, Souza, Grear, & Reis dos Santos 16696 (Ld); Ratter, Santos, Souza, & Ferreira R.1588 (N). BOLIVIA: Santa Cruz: J. Steinbach 7027 (E-936448).

LIPPIA VERNONIOIDES var. *ATTENUATA* (Mart.) Moldenke, *Phytologia* 27: 67. 1973.

Synonymy: *Lippia attenuata* Mart., *Flora* 21, Beibl. 2: 59. 1838. *Lippia hirsuta* f. *latifolia* Kuntze ex Moldenke, *Résumé Suppl.* 12: 10, in syn. 1965. *Lippia hirsuta* var. *vernonioides* f. *latifolia* Kuntze, in herb.

Bibliography: Mart., *Flora* 21, Beibl. 2: 59. 1838; Schau. in A. DC., *Prodr.* 11: 589. 1847; Buek, *Gen. Spec. Syn. Candoll.* 3: 265. 1858; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, imp. 1, 2: 95 (1894), imp. 2, 2: 95 (1946), and imp. 3, 2: 95. 1960; Moldenke, *Phytologia* 27: 67. 1973; Moldenke, *Biol. Abstr.* 57: 3780. 1974; Moldenke, *Phytologia* 28: 439, 440, & 459. 1974.

This variety, only recently recognized as such, differs from the typical form of the species in having the pubescence on its stems and branches more or less appressed and usually shorter, not long and persistently divergently stiff-hirsute.

The original description by Martius (1838) is: "caule tetragono suffruticoso, strigilloso; foliis lato-lanceolatis vel oblongis in petiolos cuneato-attenuatis, antice serratis, postice integerrimis, supra hirsuto-asperis, subtus villosu-tomentosis, subincanis; spicis cylindricis in pedunculis alaribus, vel terminalibus dichotomo-paniculatis, bracteis obovato-rhombeis acutis dorso hirsuto-incanis. Crescit prope Cujabá. Majo floret."

In my previous publications on this genus I included this taxon in typical *L. vernonioides* Cham., but more recent study persuades me of its distinctness and worthiness of nomenclatural status. The type of the variety actually is Martius 87 [224] in the Munich herbarium. Kuntze's *L. hirsuta* f. *latifolia* as well as his *L. hirsuta* var. *vernonioides* f. *latifolia* are based on his collection made at 400 meters altitude at Yapacani, Santa Cruz, Bolivia, in 1892, and is deposited in the Britton Herbarium at the New York Botanical Garden. According to notes in his own handwriting on the label he planned to characterize f. *latifolia* as having "foliis caulinis l: 2-3" and f. *longifolia* [typical *L. vernonioides*] as having "foliis caulinis l: 4 1/2".

Recent collectors describe var. attemata as an herb, subshrub, or shrub, 0.5—3 m. tall, the tips of the bracts brown, and have found it growing in open grassy soil, on campos, campo cerrado, campo limpo, and among stones on high campos, at altitudes of 80—1000 meters, flowering and fruiting from April to June, as well as in October and December.

The corollas are said to have been "white" on Duarte 778, Gehrt s.n., Hoehne s.n. & Com. Rondon 1304, Hoehne & Gehrt s.n., Kuntze s.n., Murça Pires & Black 2146, 2319, & 2361, and Steinbach 5581, "white, throat yellow, mauve in age" on Hunt & Ramos 5540, "white, rose and yellow in center" on Macedo 2288, "yellowish-white" on Mendes Magalhães 19025, "pale-lilac" on Hatschbach & Ahumada 31228, and "lavender" on Irwin & al. 17537, while on W. Hoehne 2709 it is stated "inflorescencia amarelada".

Material of this taxon has in the past been uniformly distributed as L. vernonioides Cham. or as Lantana sp.

Citations: BRAZIL: Goiás: Irwin, Souza, Grear, & Reis dos Santos 17537 (Ac, N); Murça Pires & Black 2361 (Z). Maranhão: Murça Pires & Black 2146 (N), 2319 (N). Mato Grosso: Hatschbach 32062 (Ld, W—2744568); F. C. Hoehne Com. Rondon 1304 (N); Hunt & Ramos 5540 [Hunt 5540] (N); Martius 87 [224] (Br—istotype, F—photo of isotype, Mu—147—type, N—photo of isotype, Si—photo of isotype, Z—photo of isotype). Minas Gerais: Duarte 778 [Herb. Jard. Bot. Rio Jan. 58834] (N); Hatschbach & Ahumada 31228 (Ld, N, N, W—2706089); Hoehne & Gehrt s.n. [Turvo, April 24, 1926] (N, Sp—17475); Macedo 2288 (N); Mendes Magalhães 19025 [Herb. Brad. 28163] (N); Mosén 4319 (N, S). Pará: Murça Pires 2361 (N); Pinheiro & Carvalho 498 (Ld). São Paulo: Gehrt s.n. [Itarapina, April 30, 1923] (N, Sp—8351); F. C. Hoehne s.n. [Mogy-mirim, May 21, 1927] (N, N, Sp—20411); W. Hoehne 2709 (Bh, It, Ml, N, Qu, Ug, W); Kiehl s.n. [Herb. Inst. Agr. Est. S. Paulo 3764] (N, Sp—41982); Riedel & Lund 2073 (N). BOLIVIA: El Beni: H. H. Rusby 927 in part (C, N, Pa, Pa, Pr). La Paz: H. H. Rusby 926 (C). Santa Cruz: M. Cárdenas 1935 (N), 2028 (N); Kuntze s.n. [Velasco, VII. 92] (N, N, W—701988), s.n. [Yapacani, 6.92] (N); Peredo s.n. [6—XII—1946] (N, S); J. Steinbach 5581 (N, Ug).

LIPPIA VILLAFLORIDANA Kuntze

Additional bibliography: Moldenke, Biol. Abstr. 47: 7190 & 8471. 1966; Moldenke, Phytologia 13: 167—169. 1966; Hocking, Excerpt. Bot. A.11: 104. 1967; Hocking, Pharmaceut. Abstr. 9 (3): no. 1067. 1968; Moldenke, Fifth Summ. 1: 157, 187, & 189 (1971) and 2: 554, 568, & 895. 1971; Troncoso, Darwiniana 18: 335, 340, & 410. 1974; Moldenke, Phytologia 38: 480. 1978.

Troncoso (1974) says that "las especies de esta nueva sección Dioicolippia, fueron segregadas de la sección Zapania, series Axilliflorae y Paniculatae, del sistema de Schauer.

[to be continued]